

The Bioeconomy Consultants



News Review

Issue Sixty-Six

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Each month we review the latest news and select key announcements and commentary from across the biofuels sector.



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Foreword

Welcome to September's Biofuels News Review, with an extended feature concerning this month's RTFO Consultation Response.

In the EU, biofuels made up just over 5% of fuel consumption in 2017. The UK has continually been behind on this, with only 3% of our current transport fuel being biofuels, but government targets are in place to help address this through recent changes made to the UK's Renewable Transport Fuel Obligation (RTFO).

Back in 2005, before the RTFO was introduced, biofuels only formed 0.25% of the UK's fuel, some were made directly on farms and some were imported. This was not high enough to be in keeping with the EU's recently published biofuels directive, which imposed targets of 5.75% biofuels content in the fuel mix by 2010, with an interim target of 2% in 2005, which the UK was already well behind. The RTFO was initially announced in 2005, and would oblige suppliers of liquid fuels to report on the level of biofuel they were blending, with minimum targets amounting to 5% of volume by 2010. This was enshrined in legislation in 2008, and although the UK did not reach the 5% target by 2010 (achieving 3.3%), the signs were promising. By that point, the EU targets had been re-evaluated with the onset of the Renewable Energy Directive (RED). The current RED targets for transport are subtly different, requiring 10% of transport energy to come from renewable sources (including biofuels and, notably, electricity) by 2020, which will require a big increase in such energy in the UK. The UK's own targets remain concerned with volumes of biofuel, and these proportions do not differ substantially from the corresponding energy output proportions. The 2017 target is 6% under the RTFO, and currently the 2020 target is 9.75%. It is important to note that some fuels are eligible for "double counting" if they are derived from wastes or residues, both under RED and the RTFO, and so the 3% figure quoted above does not tell the whole story.

The UK government announced its consultation to the RTFO in late 2016, with the consultation period running until January 2017. In September of this year, the response was published.

The consultation delved into several important issues, namely, supply trajectory, waste-derived fuels, and the eligibility of other fuels to be counted in the scheme, such as jet fuel, and non-biobased fuels, the so called RFNBO's - Renewable Fuels of Non- Biological Origin.

The current supply position, in which the target is kept at 9.75% for the period between 2020 and 2030 was called into question, with the option of increasing it further. The consultation also aimed to create a sub-target within the overall biofuel target for a new set of biofuels known as 'Developmental fuels' with much discussion as to what fuels would be eligible for this target,

and at what level the 'buy-out' price would be set, as this buy-out price essentially dictates the additional price of the biofuel to the blender. For these so called "drop in" advanced fuels, the consultation set out to determine which fuels should be supported for sectors that can't be easily decarbonised by other means e.g. aviation and HGV. The other question is at what level these fuels would be required to be blended with fossil fuel. This latter question is not an easy one to answer as unambitious targets will not provide the right level of stimulus and overambitious targets might increase prices as fuels moved closer to the buy-out price.

The final and perhaps most contentious issue concerned the level of support given to biofuels made from food crops. In 2005 the European commission provided no differentiation between food and non-food feedstocks for biofuels. In fact, the *raison d'être* of 1st generation fuels were to use the huge grain and oilseed surplus generated by EU farms every year. The UK alone produces over 3 million tonnes of grains every year that are surplus to internal and export requirements – putting this on the world market only depresses prices in emerging economies and hence the plan was to utilise this to create a biofuel that will lower carbon emission in transport and back out fossil fuels. Several years after the release of the directive, new research started to show a potential correlation between biofuels and emissions from land use change due to supply into the EU biofuels market. This caused what can only be called a policy knee jerk reaction across Europe, which continues to this day.

NGO and anti-biofuel advocates maintain that indirect land use change makes some biofuels more polluting than the fossil fuel they replace; the biofuel industry maintains that ILUC modelling is still too unproven to use in such important policy decisions and the commission should only use real world numbers for carbon emissions and food prices not ones modelled on potential future impacts. The commission now had a major decision to make; on one hand giving a low or non-existent crop cap would destroy the several billion euros developers have already invested in biofuel facilities across the EU, and on the other keeping it at 10% could risk potential 'run-away' land use change with all the negative consequences that brings. After much political wrangling by both sides the EU decided to cap the amount of energy from crops at 7% of the overall target i.e. 70% of the original target can now be met through food based biofuels such as ethanol and biodiesel. The remaining 3% is to be met by advanced biofuels, electrification and other fuels like biomethane.

The UK's Department for Transport (DfT) had been actively discussing potential crop cap levels with UK stakeholders for some time before the EU shifted its position, so to anyone in the sector this came as no surprise; what was up for debate though was the level of crop cap in the UK. The consultation provided values as low as 0% and 1.5% in addition to the EU 7% but the DfT had made it clear to stakeholders in previous meetings that a 7%

crop cap (due to ILUC and other regulatory issues that limited the amount of ethanol in petrol), allowed for the possibility of poorly performing biofuels to enter the UK market.

The majority of respondents to the consultation wanted to see an increase in the supply target post-2020, stating that the proposed continuation of the 2020 target lacked ambition, despite some respondents wanting to wait for the announcement of RED II from the European Commission. In responding to the consultation, the UK government raised the post-2020 targets such that the supply target will be 12.4% not 10% as before. This was welcomed by the industry as a declaration of faith in the market by the government, providing stability for the next few years. Some believe that the targets aren't high enough, and represent a decreasing trend in biofuel supply increase, but acknowledged that any increase was good.

The proposed sub-target for developmental biofuels was 0.1% starting in 2019, rising to 2.4% in 2030 (of total fuel supply). The overwhelming majority of consultees outside of the fossil fuels sector agreed with these levels, but requested that they be extended to run until 2032. Duly, this was implemented by the government in their consultation response, extending the sub-target to 2032 on the same trajectory, resulting in an eventual sub-target of 2.8% in 2032. In terms of fuels being made eligible as developmental biofuels, the government has made aviation fuels, hydrogen, syngas, and "drop in" fuels eligible. In the latter case, the fuel must be able to achieve at least a 25% blend with conventional fuels. To provide the stimulus for these unique fuels the government has created a new certificate known as the Developmental Renewable Transport Fuels Certificate (DRTFC), which has a buy-out price of 80pppl and as these fuels attract double reward in fact their real buy out is £1.60pppl which is a huge stimulus to developers to bring these fuels to market. To put that in a current context, a normal RTFC is 30pppl, with trading at considerably less. In reality, because all of these fuels are eligible for double counting, the functional 2032 supply target is 1.4%, but due to gaseous fuels being eligible for more than double counting, this target may be even smaller, depending on the level of hydrogen or syngas in the eventual mix.

This development is also noteworthy in that it introduced to the UK biofuels market several fuels that previously were not eligible for RTFO credits. Aviation has for many years tried to position its way into the RTFO but for many reasons this hasn't happened, until now. The response made aviation fuels eligible for RTFC's without insisting on a ringfenced blending mandate, instead making them one of the RTFO's Developmental fuels, which are eligible for the new DRTFC's. Hopefully this along with the DfT's new £25m aviation and HGV demo fuels call should bring some innovative ideas forward.

The consultation also requested input for other ways in which advanced biofuels could be promoted beyond the setting of a sub-target. The

emphasis was on a “cost-neutral” solution, for which consultees suggested greater governmental coordination for the proliferation of biofuels beyond the DfT, as well as opening up the RTFO to non-established fuels, or offering greater than double certification for some fuels, or loan/grant opportunities to aid with the difficult step of bringing development projects up to commercial scale. Unfortunately, the DfT did not see any of these suggestions as being viable and cost-neutral, and so none were implemented.

Regarding crop caps the overwhelming preference among consultation respondents was for the 7% maximum limit to be imposed, in order to protect the UK’s still fledgling bioethanol industry, which is a source of jobs in the north of England, and concerns were expressed about the lower limit options and whether they would have an adverse effect on this industry. However, the minority arguing in favour of the lower limits argued that biofuels crops would not be the most efficient use of cropland regardless of any environmental benefits of crop biofuels, and that lower limits would “strike a balance” between said environmental benefits and the promotion of other biofuels feedstocks such as wastes.

Whilst initial reports were favouring a lower cap the DfT’s response has been to go for a “balanced” approach, imposing an initial 4% limit, that will, decrease to 2% by 2032. The reduction was seen by many as rather an illogical step as a reducing target will only displace biofuels with biofuels rather than fossil fuels. It also raised further concerns among the industry that too much pressure will be placed on waste-based biofuels due to this limit, and that this could reduce the competitiveness of the UK against EU markets, which look set to impose a 7% limit.

All in all, this consultation is not the only thing set to influence UK biofuels going forward. Continuing market developments as the UK’s exit from the EU draws nearer will further shape the game, but this consultation gives an indication of the hand the UK will have to play with. The increased scope of the biofuels supply, by catering more to advanced biofuels, and to kinds of biofuel hitherto ineligible for RTFO recognition, has potential to open up new lucrative development opportunities for biofuels producers in the UK, while the government’s commitment to a greater supply target is a declaration of faith in an industry whose position is by-no-means secure, with much of the talk centring on electric cars after the government’s decision to ban conventional petrol- and diesel-fuelled cars from 2040. Perhaps feeling most disappointed will be members of the anaerobic digestion sector: biogas has recently begun to establish itself as a viable fuel, particularly for HGVs, as trialled by UK retailers John Lewis and Waitrose, but AD’s absence from the proposed RTFO amendments means that it will be business as usual for biogas fuel for now: biogas is still eligible under the RTFO, but has not received any major development in the consultation, and by extension, not received the backing it sorely needs.

Read on for the latest news.

Policy

Study shows crop biofuels just as sustainable as advanced biofuels



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A comprehensive sustainability assessment carried out by nova-Institute shows that first generation bioethanol is as advantageous as second-generation bioethanol for a feasible climate strategy. The results clearly indicate that the systematic discrimination against first generation biofuels of the current Commission proposal is in no way founded on scientific evidence. It would be counterproductive to further lower the share of first generation fuels in the EU's energy mix.

The analysis of twelve different sustainability criteria shows that all of the researched bioethanol feedstocks offer significant strengths, but also weaknesses in terms of sustainability: All feedstocks realise substantial reductions of greenhouse gas emissions (GHG). While second generation fuels perform better in this regard, this effect is strongly relativised, when offset against the abatement costs. Reducing GHG emissions through second generation biofuels is a rather expensive way to mitigate climate change.

When it comes to the often-criticised negative impact on food security of first generation biofuels, the evidence points into a different direction. The competition for arable land is counterbalanced by the excellent land efficiency

of first generation crops (especially sugar beet) and protein-rich co-products (especially wheat and corn). In this regard, the utilisation of short rotation coppice (SRC) for biofuels poses much stronger competition for arable land, since they use up much larger acreages of arable land and provide no protein-rich co-products.

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Click [here](#) for more information.

Biofuel blend to hit 10% in Brazil

Brazil plans to increase the volume of biodiesel blended with diesel sold at the pump to 10% from March 1, 2018, about a year ahead of originally expected, as the government works to lift the country's biofuels output, reduce oil-product imports and meet requirements under the Paris Accords.

Brazil's National Energy Policy Council will also have to approve the increase. The CNPE's approval will likely happen at its regularly scheduled meeting in December, although a special meeting could be held before then if needed.

Brazil expects to announce the early increase to the biodiesel-diesel blend in coming weeks along with details about RenovaBio, a government package of incentives and regulatory measures aimed at opening Brazil's biofuels segment to greater competition, attracting investments and increasing output and consumption of biofuels such as biodiesel and sugarcane-based ethanol.

RenovaBio could be launched as a presidential decree or a bill. Presidential decrees are typically quicker to implement and need less input from Brazil's Congress, but a flurry of the measures are already winding their way through the halls of government and clogging up the pipeline.

The current delays may make a bill submitted under rules ensuring urgent consideration by Congress quicker to get implemented.

Each 1% increase in the biodiesel-diesel blend, which was increased to 8% on March 1, 2017, accounts for about 600 million litres of biodiesel production and consumption, according to several industry trade groups.

The increased biodiesel use also directly reduces the volume of diesel imports also needed to meet domestic demand for the fuel.

Brazil had previously planned to increase the biodiesel-diesel blend to 9% on March 1, 2018.

Click [here](#) for more information.

USA lifts summer ban on E15 early

In a typical September, the Environmental Protection Agency's (EPA) onerous summer restriction on selling 15% ethanol blends (E15) would end this weekend. But with Hurricanes Harvey and Irma wreaking havoc on the nation's fuel market, this September has been anything but typical.

Fortunately, emergency fuel waivers issued by EPA ended the summer restriction on E15 two weeks early in 38 states, thanks in part to a request by the Renewable Fuels Association to EPA Administrator Scott Pruitt. E15 has helped to offset gasoline supply shortfalls, limit fuel price spikes, and give consumers a higher-octane choice at the pump. Ethanol's ability to extend fuel supplies and dampen price shocks during this chaotic time in the marketplace underscores the need for EPA to eliminate the summer restriction on E15 and allow year-round sales of the fuel nationwide. Since Hurricane Harvey made landfall on Aug. 25, ethanol prices have averaged a 14% discount to gasoline prices (25 cents per gallon).

Beginning Saturday, Sept. 16, consumers in states will have unfettered access to E15, thanks to the end of EPA's summer volatility control season. In 2011, EPA approved the use of E15 in 2001 and

newer vehicles, but the agency did not allow E15 to benefit from the 1-pound per square inch (psi) Reid Vapor Pressure (RVP) waiver that is available to E10 blends. As a result of this disparity, retailers in conventional gasoline areas (most of the country) would have to secure specialty gasoline blendstocks in order to continue selling E15 in the summer. Such gasoline blendstock is generally unavailable in conventional gasoline areas and would be uneconomical to ship. EPA has jurisdiction over gasoline volatility from June 1–Sept. 15 every year.

Click [here](#) for more information.

Report shows how biofuels will help Canada achieve green goals

The Canadian government's existing ethanol blend mandate has played a key role in reducing the carbon intensity in gasoline, while providing market access and economic stability for Canada's ethanol industry. Maintaining Renewable Fuel Standards can be an integral part of Canada's transition to a low-carbon future, according to a new Conference Board of Canada report.

The climate benefits of ethanol blending are clear and well documented. Greenhouse gas emissions from the use of Canadian-produced ethanol are as much as 60 per cent lower than from gasoline use. Current estimates demonstrate that ethanol blending in 2013 reduced Canada's gasoline-related GHG emissions by at least 2.1 megatonnes.

Click [here](#) for more information.

Malaysia and Indonesia to push palm-oil biofuel in China



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Malaysia and Indonesia are in talks on possible implementation of B5 biodiesel program in China, given the Chinese increased environment control in the palm oil market.

According to the Malaysian Minister of Plantations and Commodities Industry, Mah Siew Keong, the new product is a blend of 5 percent palm oil or palm methyl ester (PME) and diesel. It would be a game changer for the oil palm industry worldwide.

Keong said apart from China, Malaysia and Indonesia would work together to export biodiesel to India.

In a statement distributed in conjunction with the meeting, he also said both countries had agreed that palm oil producing nations needed to strengthen their alliance in combating the campaign against the commodity and trade impediments.

Mah in the statement said both countries agreed that palm oil was an important commodity in terms of providing employment, foreign exchange earnings and socioeconomic development, especially for smallholders.

Currently, Indonesia and Malaysia are the major global palm oil producers, accounting for 85 percent of production and 91.2 percent of exports globally.

Click [here](#) for more information.

Markets

Brazil imposes tariffs on US biofuels

The Renewable Fuels Association, Growth Energy and the U.S. Grains Council are calling upon the U.S. government to develop an immediate response to Brazil's newly implemented tariffs on U.S. ethanol imports, a trade barrier that threatens over \$750 million in U.S. exports and American jobs.

On August 23, 2017, Brazil's Chamber of Foreign Trade imposed an immediate two-year tariff-rate quota (TRQ) system for ethanol imports. Under the TRQ, a 20 percent tariff will be applied to purchases from the U.S. after a 600 million-litre (158.5 million gallon) quota is met. This year fuel ethanol exports to Brazil are at 1.17 billion litres (310 million gallons) through July, according to Census Bureau trade data.

The three organizations, which work jointly and with the U.S. Department of Agriculture (USDA) to develop overseas markets for U.S. ethanol, are imploring the Administration to immediately engage their Brazilian counterparts on the future of their relationships with regard to biofuels. It is vital that the Administration take immediate action and consider all avenues to encourage Brazil to either revoke the TRQ or substantially increase the tariff-free quota level to better reflect the current ethanol market and trade realities.

Brazil's tactics are the latest step in a troubling global trend towards protectionist tariffs and other actions against the American biofuels industry. As the largest ethanol export market for American producers, the impact of this economic attack is both damaging and thoroughly counterproductive. American jobs, farms, and businesses are at risk; this cannot go unanswered.

Click [here](#) for more information.

Australian E10 set to undercut unleaded petrol price



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A petrol price war is brewing for the school holidays as an independent retailer drops the cost of E10 by 6¢ a litre from today.

The move means the price of E10 will tumble well below the cost of unleaded fuel to just 1.06¢.

Queensland's peak motoring body yesterday welcomed the move by United Petroleum and said it expected other servos to follow suit.

Click [here](#) for more information.

Technavio's White Biotechnology market forecast

The research study covers the present scenario and growth prospects of the global white biotechnology market for 2017-2021. To calculate the market size, Technavio analysts have used the revenue generated from the retail sales of white biotechnology products.

White biotechnology has enabled the commercial manufacturing of several products such as curd, cheese, and beverages by using natural metabolic pathways and various microorganisms. Earlier, these bio-based products were not commonly used in industries. They were used in niche industries such as biofuel production. However, today, several industries such as pharmaceutical and F&B use bio-based products to produce APIs

and enzymes to enhance the texture and aroma of food.

Crude oil is the most important source of energy as many industries rely on the use of chemicals that are derived from crude oil. However, the lack of oil reserves and environmental concerns have driven the need to develop sustainable methods to produce such chemicals. White biotechnology helps produce such materials from renewable sources. It provides substantial benefits when compared with conventional methods.

Biofuels are fuels produced from biomass.

Biomass is an organic matter produced from animals and plants. It includes wood, agricultural crops and products, aquatic plants, forestry products, waste and residues, and animal wastes. Biofuels can be used as a substitute for jet fuel. This helps reduce GHG emissions, which is driving their adoption across the world.

Click [here](#) for more information.

Research & Development

COMSYN project aims to develop competitive gasification fuels

EU-funded project COMSYN aims to develop a production concept for competitive bio-based fuels by means of a compact gasification and synthesis process. The target reduction of the biofuel production cost is up to 35% compared to alternative routes, which translates to less than 0.80 €/l production cost for diesel.

The production concept is based on the distributed primary conversion of various kind of biomass residues to intermediate liquid products at small-to-medium scale (10-50 kt/a Fischer-Tropsch products, 30-150 MW biomass) units located close to biomass resources. The Fischer-

Tropsch products will be upgraded to fuels in existing central oil refineries, also bringing the benefits of economy of scale for the overall process.

The smaller scale of primary conversion lowers the risks of the investment, which has been the main bottleneck for large-scale biofuel plants. Integration of the primary conversion to local heat and power production is estimated to result in 80% energy efficiency in biomass utilization.

The COMSYN project validates the process concept from biomass gasification to final biofuel product. The gasification of biomass and the gas cleaning process are developed and piloted by VTT Technical Research Centre of Finland Ltd together with GKN Sinter Metals Filters GmbH.

The synthesis process utilizes a modern intensified Fischer-Tropsch reactor by INERATEC GmbH and one of the key targets of the project is to further develop the technology for even higher syngas conversion. Refining of Fischer-Tropsch products to high quality drop-in liquid transport fuels is done at UniCRE, the Unipetrol Centre for Research and Education.

Click [here](#) for more information.

Vertimass receives green light for biofuel technology



Vertimass

Vertimass LLC has announced completion of intermediate technology validation from the U.S. Department of Energy's Bioenergy Technology Office (BETO), which verified performance against negotiated milestones, provided progress on scale-up, and reviewed Vertimass' estimated cost for their transformative catalytic technology.

Vertimass believes this BETO verification paves the way for Vertimass to move to the engineering

scale of this important technology for converting sustainable ethanol into fungible gasoline, diesel, and jet fuel blend stocks and the chemical building blocks benzene, toluene, and xylene (BTX). This new Vertimass pathway can enhance use of biomass-derived renewable fuels that lower greenhouse gas emissions and allow ethanol producers to expand their product portfolio to include renewable hydrocarbons, which are compatible with the existing fuels and chemicals infrastructure, as well as ethanol.

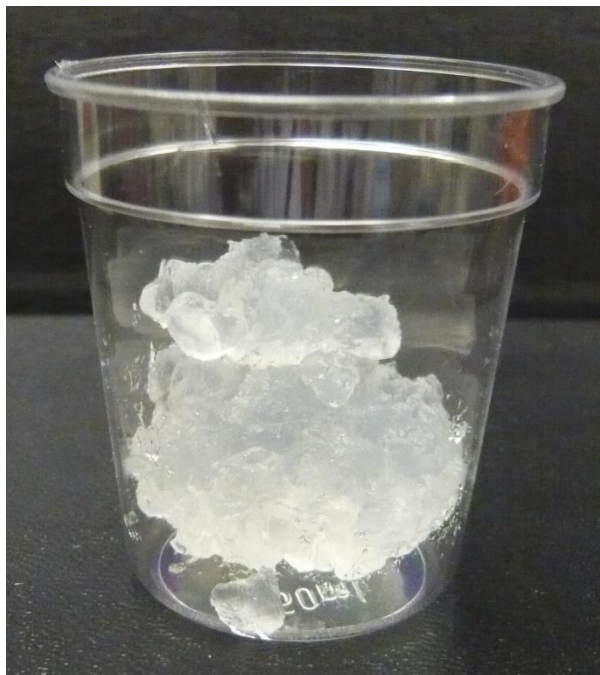
Click [here](#) for more information.

Microbe membrane discovery leads to more efficient ethanol production

Efficient substrate utilization is the first and most important prerequisite for economically viable production of biofuels and chemicals by microbial cell factories. However, production rates and yields are often compromised by low transport rates of substrates across biological membranes and their diversion to competing pathways. This is especially true when common chassis organisms are engineered to utilize non-physiological feedstocks. Here, researchers addressed this problem by constructing an artificial complex between an endogenous sugar transporter and a heterologous xylose isomerase in *Saccharomyces cerevisiae*. Direct feeding of the enzyme through the transporter resulted in acceleration of xylose consumption and substantially diminished production of xylitol as an undesired side product, with a concomitant increase in the production of ethanol. This underlying principle could also likely be implemented in other biotechnological applications.

Click [here](#) for more information.

New enzyme isolated for rapid hydrolysis of crystalline cellulose



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The crystalline nature of cellulose microfibrils is one of the key factors influencing biomass recalcitrance which is a key technical and economic barrier to overcome to make cellulosic biofuels a commercial reality. To date, all known fungal enzymes tested have great difficulty degrading highly crystalline cellulosic substrates. Researchers have demonstrated that the CelA cellulase from *Caldicellulosiruptor bescii* degrades highly crystalline cellulose as well as low crystallinity substrates making it the only known cellulase to function well on highly crystalline cellulose. Unlike the secretomes of cellulolytic fungi, which typically comprise multiple, single catalytic domain enzymes for biomass degradation, some bacterial systems employ an alternative strategy that utilizes multi-catalytic domain cellulases. Additionally, CelA is extremely thermostable and highly active at elevated temperatures, unlike commercial fungal cellulases. Furthermore, they have determined that the factors negatively affecting digestion of lignocellulosic materials by *C. bescii* enzyme cocktails containing CelA appear to be significantly different from the performance

barriers affecting fungal cellulases. Here, they explore the activity and degradation mechanism of CelA on a variety of pre-treated substrates to better understand how the different bulk components of biomass, such as xylan and lignin, impact its performance.

Click [here](#) for more information.

D3MAX to build full-scale plant at Ace Ethanol

Last February, D3MAX LLC announced the completion and shipment of its pilot plant employing the patented D3MAX cellulosic ethanol technology to Ace Ethanol LLC, in Stanley, Wisconsin. Pilot testing of the patented D3MAX corn fibre-to-ethanol process has been successful, allowing D3MAX to move to the next stage of commercial deployment—the design of a full-scale D3MAX plant at Ace Ethanol.

D3MAX has now reached a major milestone on its path to commercialization. The next phase for D3MAX is to design a commercial-scale D3MAX process for the Ace Ethanol plant in Stanley.

D3MAX has signed a contract with AdvanceBio Systems LLC for a full-scale D3MAX design integrated with the Ace Ethanol plant in Stanley, and upon the completion of the commercial design, the Ace Ethanol board will decide if the process will be installed at the plant. This production facility is the same facility where the pilot plant was tested.

Click [here](#) for more information.

Bioethanol

Enerkem begins pioneering production of cellulosic ethanol from waste

Enerkem Inc., a world leading biofuels and renewable chemicals producer, has announced it has started the commercial production of cellulosic ethanol. Enerkem's game-changing facility in Edmonton, AB, Canada, is the first commercial-scale plant in the world to produce cellulosic ethanol made from non-recyclable, non-compostable mixed municipal solid waste.

The company has been producing and selling biomethanol since 2016, prior to expanding production to include cellulosic ethanol with the installation of its methanol-to-ethanol conversion unit earlier this year.

Advanced biofuels play a vital role in the transition towards sustainable mobility by producing transportation fuels that replace a portion of gasoline. Enerkem's technology not only provides a clean transportation fuel, it also disrupts the traditional waste landfilling and incineration models by offering a smart alternative to communities wanting to recover waste while sustainably fuelling vehicles.

Click [here](#) for more information.

Södra to produce methanol as biofuel

Södra will invest more than SEK 100 million in the production of biomethanol, a sustainable fuel from forest raw material. The project will commence in autumn 2017 and is scheduled to be ready for operation by spring 2019.

The aim is to produce 5,000 tonnes of biomethanol per year at the new facility to be situated at Södra's pulp mill at Mönsterås. The long-term aim is to further increase production for passenger, truck and ship transport.

The biomethanol will be made from the crude methanol produced by the manufacturing process at Södra's pulp mill. It will be part of the circular process that already exists at Södra's mills, in which all parts of the forest raw material are used for the best possible effect. The first delivery will reach the market in spring 2019.

Click [here](#) for more information.

Clariant licenses sunliquid ethanol to Enviral

Clariant, a world leader in specialty chemicals, and Enviral, the largest producer of bioethanol in Slovakia, have announced that they have signed a license agreement on sunliquid® cellulosic ethanol technology.

Enviral has acquired a license to use Clariant's sunliquid technology as part of its goal to realize a full scale commercial cellulosic ethanol plant for the commercial production of cellulosic ethanol from agricultural residues. This new plant will be owned and operated by Enviral and is planned to be integrated into the existing facilities at Enviral's Leopoldov site in Slovakia with an annual production capacity of 50,000 tons. It will use Clariant's sunliquid technology as well as starter cultures from its proprietary enzyme and yeast platforms to process Enviral feedstock into cellulosic ethanol.

Clariant and Enviral conducted extensive tests of Enviral's feedstock with Clariant's technology to ensure effective and efficient compatibility. These tests, conducted at Clariant's pre-commercial sunliquid demonstration plant in Straubing (Germany), provided excellent results and formed the basis for the project decision. Next steps are detailed engineering studies before the official ground breaking which is expected at the end of 2017.

As a further step in the commercialization of sunliquid, Clariant decided to set-up a new Business Line Biofuels, as part of the Business Area

Catalysis, which is responsible for further developing the biofuels business across the board and report its performance.

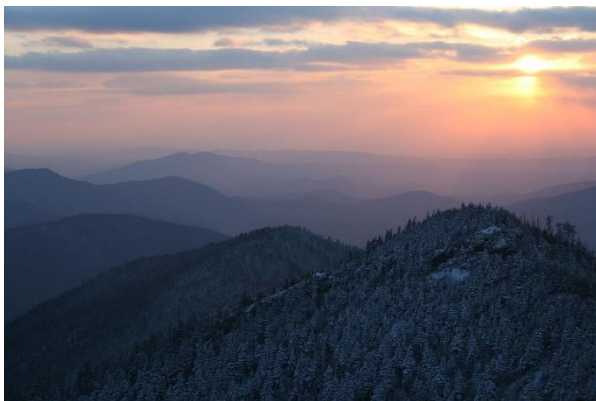
Cellulosic ethanol is an advanced and truly sustainable biofuel which is almost carbon neutral. It is produced from agricultural residue such as wheat straw and corn stover that is obtained from farmers. By using agricultural residue, cellulosic ethanol can extend current biofuels production to new feedstocks and improved performance.

The sunliquid technology offers a completely integrated process design built on established process technology. Innovative technology features like the integrated production of feedstock and process specific enzymes and simultaneous C5 and C6 fermentation ensure best commercial performance.

Click [here](#) for more information.

Biodiesel

US National Park runs on biodiesel for cleaner air



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The last thing a hiker wants to encounter is a haze of smog that diminishes the view from atop a picturesque vista.

With more than 11 million visitors annually, Great Smoky Mountains National Park strives to maintain its pristine natural beauty by adopting

practices that reduce the park's environmental footprint.

In 2016, the park used 43,085 gallons of biodiesel (B20) resulting in the following estimated emissions reductions: 15 percent reduction in carbon dioxide; 12 percent reduction in carbon monoxide; 20 percent reduction in both hydrocarbon and sulphur dioxide and 12 percent reduction in particulate matter.

In keeping with its history of preservation, Great Smoky Mountains National Park first began using biodiesel blends to power park-owned diesel vehicles and equipment in 2003.

The cleaner-burning fuel has been used park-wide since 2006.

Today, numerous locations in the park use B20 to power 40 pieces of heavy equipment such as dump trucks, graders, front-end loaders, a bucket truck and more.

Additionally, Bioheat® is used to heat the park's headquarters building.

The trolley systems in the neighbouring towns of Pigeon Forge and Gatlinburg, Tenn. also use B20.

Gatlinburg's trolley fleet is the fifth-largest mass transit system in the state and has grown to 20-plus trolleys servicing approximately 50 miles of trolley routes.

Made from an increasingly diverse mix of resources such as recycled cooking oil, soybean oil and animal fats, biodiesel is a renewable, clean-burning diesel replacement that can be used in existing diesel engines without modification.

It is the first commercial-scale fuel produced across the U.S. to meet the EPA's definition as an Advanced Biofuel - meaning the EPA has determined that biodiesel reduces greenhouse gas emissions by more than 50 percent when compared with petroleum diesel.

Click [here](#) for more information.

Aviation Fuel

Velocys to produce jet fuel from waste in the UK

Velocys, the renewable fuels company, is pleased to announce that it has entered into a partnership to prepare the business case for a commercial scale waste-to-renewable-jet-fuel plant in the UK. Velocys will lead this initial feasibility stage of the project, for which all members of the partnership are providing funding. Subject to this and to the successful completion of all development stages, the aim is to achieve a final investment decision in 2019.

The members of the partnership include: British Airways, the UK's largest international airline, which intends to fly with the jet fuel made in the plant; Suez, a world leading expert in recycling and waste management, which intends to provide technical and operational expertise and manage the supply of feedstock to the project; Norma, an affiliate of Ervington Investments, Velocys' largest investor, which is a potential investor in the project; Velocys, which intends to supply its technology to the plant and provide project management, engineering, operations and technical service support to the project going forward.

The plant would take hundreds of thousands of tonnes per year of post-recycled waste, destined for landfill or incineration, and convert it into clean-burning, sustainable fuels. The jet fuel produced is expected to deliver over 60% greenhouse gas reduction and 90% reduction in particulate matter emissions compared with conventional jet fuel, thereby contributing to both carbon emissions reductions and local air quality improvements around major airports.

Velocys believes that there is the opportunity to develop a series of waste-to-jet fuel plants in the UK. The changes to the Renewable Transport Fuels Obligation (RTFO) recently published by the Department for Transport provide the required

commercial platform for this opportunity; for the first time, jet fuel is to qualify for credits under the RTFO. These changes to the RTFO are designed to promote sustainable aviation and heavy goods transport; once implemented, they are expected to provide long term policy support for this market.

Click [here](#) for more information.

Neste to assist in decarbonising Geneva airport



Wikimedia Commons

Neste and Genève Aéroport are pioneering together to make flying more sustainable by starting to decarbonize aviation towards fossil neutral growth. Genève Aéroport is planning the introduction of renewable jet fuel for aircraft operations from Geneva International Airport; the target shall be at least 1% (one percent) of the annual jet fuel consumption at Genève Aéroport shall be composed of renewable jet fuel starting late 2018. This is an excellent example of a state, an airport and a renewable solutions provider collaborating to decrease CO2 emissions in aviation.

Aviation is the fastest growing means of transport and thus emissions will grow substantially. The International Civil Aviation Organization (ICAO) has set a target that from 2020 onwards the growth in aviation is carbon-neutral. Currently, the only viable alternative to fossil liquid fuels for powering commercial aircraft is sustainable renewable jet fuel, which is one the most efficient means of decreasing greenhouse gas emissions. It can be adopted immediately without the need for

additional investments in new fuel distribution infrastructure.

For Neste, the development of Neste MY Renewable Jet Fuel(TM) has been a long journey taking several years: from building proof of concept to ensuring the quality and performance that fully meet the aviation industry's expectations. Neste's renewable jet fuel technology and quality is proven in thousands of commercial flights by e.g. Lufthansa and is now ready for commercialization.

Neste is the world's leading renewable diesel producer from waste and residues, and with its renewable diesel it has helped to decarbonize traffic by 33 million tons over the past 10 years. This is equivalent to 2 years' emissions from the Swiss transport sector. Now this expertise and renewable solution is available for aviation.

Click [here](#) for more information.

Other Fuels

New Holland releases 100% methane tractor



Pexels

The development of New Holland's innovative 100% methane powered tractor is making progress and the second generation T6.180 Methane Power tractor prototype has completed extensive testing across Europe, proving its worth in a wide variety of conditions, while the first generation T6.140 has begun a new testing cycle in Brazil. The second-generation prototype has been extensively tested by customers in Italy, Spain, the UK, Germany, Denmark and the Netherlands.

The original prototype is touring farms and agricultural cooperatives in the West Paraná region in Brazil, where it is field tested to collect data on the viability of bio-methane as a fuel for agricultural equipment. The project also includes a series of activities aimed at promoting the development of a supply chain for biogas generated from urban and agricultural organic waste. The T6 Methane Power tractor is also playing an important role in raising awareness of the opportunities of alternative fuels for a sustainable agriculture, by making public appearances at a variety of events.

The T6.180 Methane Power is fitted with a NEF6 engine produced by FPT Industrial and its

configuration is very similar to that of currently manufactured diesel tractors. The compressed methane is stored in 9 tanks that are integrated into the overall design, with operational ground clearance as per standard models. The 52-kilo tank capacity delivers approximately half a day of autonomy during normal operation. The Methane Power tractor yields fuel cost savings of up to 25% compared with diesel or agricultural diesel machines and has 80% lower polluting emissions than a standard Diesel tractor. It is already capable of fulfilling future greenhouse gas targets, which are expected to require a 20% reduction across Europe by 2020. CO2 emissions reductions and up to 40% fuel cost savings can be further achieved by using biomethane produced on the farm itself.

Click [here](#) for more information.

Events

EFIB 2017

Brussels, 9th-11th October 2017

The 10th European Forum for Industrial Biotechnology and the Bioeconomy (EFIB) returns to Brussels October 2017 and will attract industry executives committed to a shift towards renewable, biologically-based manufacturing. EFIB is organised by EuropaBio, Europe's largest and most influential biotechnology industry group and Smithers Rapra, global leader in rubber, plastics, polymer and composites information products.

Click [here](#) for more information.

Bioeconomy Investment Summit Helsinki, 14th-15th December 2017

Join us on 14-15 December 2017 in Helsinki, Finland for the 2017 Bioeconomy Investment Summit.

Over 30 speakers from across the globe will share their views on how we can bring together the economy and the environment.

New advances in technology mean that everything that can be made out of oil can be made from renewable, biological resources. There are huge environmental and business opportunities for a wide range of industries: construction, chemicals, textiles, energy, plastics.

The bioeconomy gives us a unique opportunity for building a sustainable future. Our speakers will focus on what investment steps we need to take to make it happen.

Click [here](#) for more information.

RRB 14

Ghent, 30th May - 1st June 2018

The 14th edition of the International Conference on Renewable Resources & Biorefineries will take place in Ghent, Belgium from Wednesday 30 May until Friday 1 June 2018. Based on the previous RRB conferences, this conference is expected to welcome about 350 international participants from over 30 countries.

Delegates from university, industry, governmental and non-governmental organizations and venture capital providers will present their views on industrial biotechnology, sustainable (green) chemistry and agricultural policy related to the use of renewable raw materials for non-food applications and energy supply. The conference further aims at providing an overview of the scientific, technical, economic, environmental and social issues of renewable resources and biorefineries in order to give an impetus to the

biobased economy and to present new developments in this area.

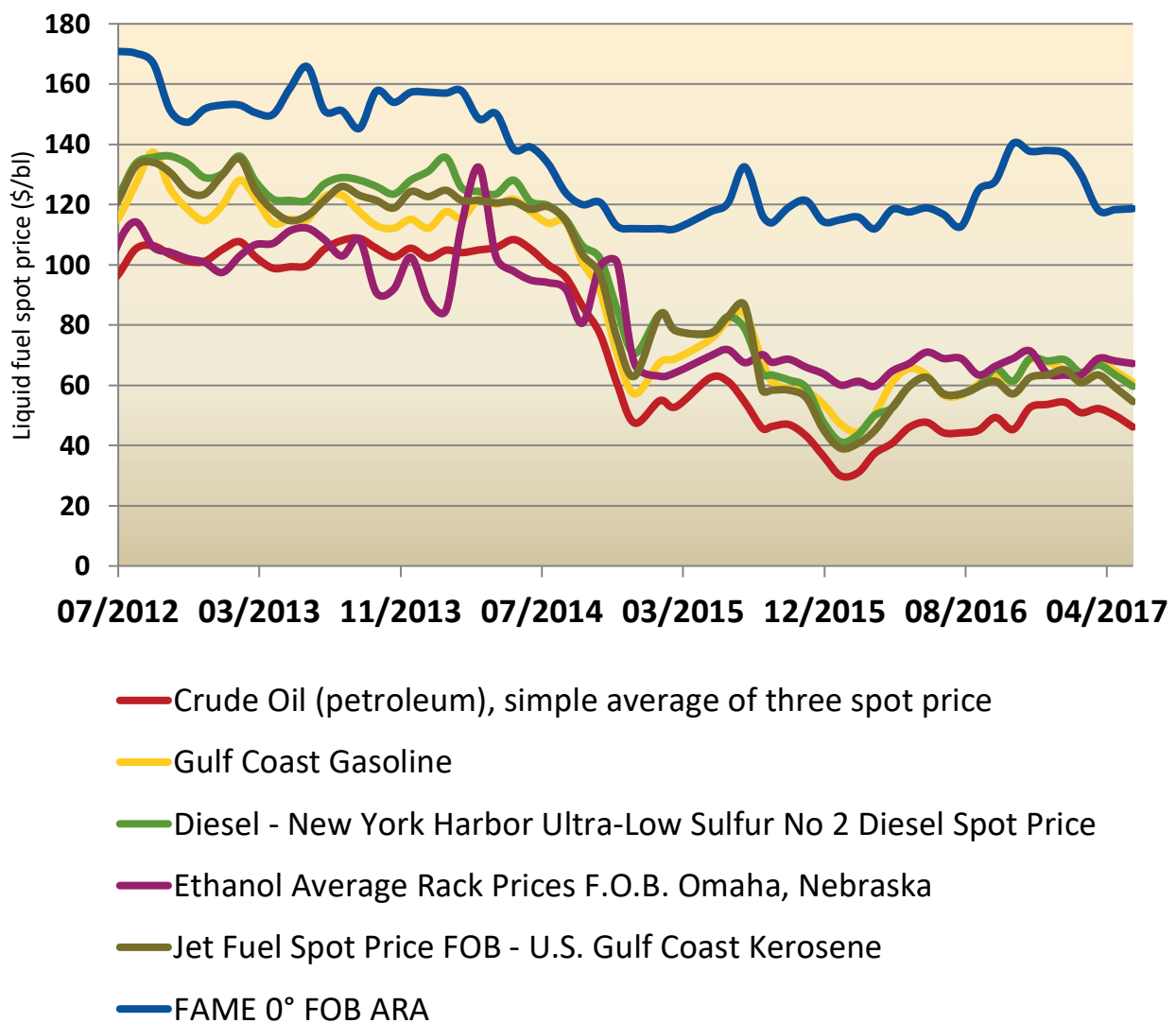
The conference will provide a forum for leading political, corporate, academic and financial people to discuss recent developments and set up collaborations.

The three-day international conference will consist of plenary lectures, oral presentations, poster sessions and an exhibition. Companies and research organizations are offered the opportunity to organize a satellite symposium.

Click [here](#) for more information.

Price Information

Historical spot prices of liquid fossil fuels and liquid biofuels. Five years prices and up to June 2017 are given in \$ per barrel.



Prices of Crude oil, diesel, gasoline, and jet fuel are recorded from www.indexmundi.com; Price of ethanol from www.neo.ne.gov; Biodiesel spot prices from <http://www.kingsman.com>

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